



Numerical simulation of tornadoes' meteorological conditions over Greece: A case study of tornadic activity over NW Peloponnese on March 25, 2009

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Recent research revealed that NW Peloponnese, Greece is an area that favours pre-frontal tornadic incidence. This study presents the results of the synoptic analysis of the meteorological conditions during a tornado event over NW Peloponnese on March 25, 2009. Further, the role of topography in tornado genesis is examined. The tornado was formed approximately at 10:30 UTC, south-west of Vardas village, crossed the Nea Manolada and faded away at Lappas village, causing several damage. The length of its track was approximately 9-10 km and this tornado was characterized as F2 (Fujita scale) or T4-T5 in TORRO intensity scale.

Synoptic analysis was based on ECMWF datasets, as well as on daily composite mean and anomaly of the geopotential heights at the middle and lower troposphere from NCEP/NCAR reanalysis. In addition, numerous datasets derived from weather observations and remote sensing were used in order to interpret better the examined extreme event.

Finally, a numerical simulation was performed using the non-hydrostatic Weather Research and Forecasting model (WRF), initialized with ECMWF gridded analyses, with telescoping nested grids that allow the representation of atmospheric circulations ranging from the synoptic scale down to the meso-scale. In the numerical simulations the topography of the inner grid was modified by: a) 0% (actual topography) and b) -100% (without topography).